PB-246 829-T

THE KAWASAKI CITY PUBLIC DAMAGE SURVEILLANCE CENTER

Environmental Protection Agency
Research Triangle Park, North Carolina

August 1972

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324214
PB 246 829 -T
EPA-TR 361-73

PUBLIC DAMAGE BUREAU, KAWASAKI CITY
August, 1972.

THE KAWASAKI CITY PUBLIC DAMAGE SURVEILLANCE CENTER

[Kawasaki Shi Kogai Kanshi Senta]

[Unattributed]

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BIBLIOGRAPHIC DATA SHEET	1. Report No. EPA TR 361-73	2.	3. Recipient's Accession No. PB 246 829-T
4. Title and Subtitle: Kawasaki City Public Damage Surveillance Center			5. Report Date: Aug., 1972
			6.
7. Author(s): Unattributed			8. Performing Organization Rept. No.
9. Performing Organization Name and Address: Translated from the Japanese by EPA			10. Project/Task/Work Unit No.
			11. Contract/Grant No.
12. Sponsoring Organization Name and Address: EPAISD Translation Services, Research TRiangle PArk, N.C., 27711			13. Type of Report & Period Covered
			14.

15. Supplementary Notes: Public Damage Bureau, Kawasaki City

16. Abstracts

17. Key Words and Document Analysis. 17a. Descriptors

EPAISD, Air Pollution Abatement
Air Pollution Laboratories
Air Pollution Continuous Sampling
Air Pollution Detection

17b. Identifiers/Open-Ended Terms

Automatic Air Pollution Surveillance
Air Pollution Measurement Equipment
Sulfur Dioxide levels

17c. COSATI Field Group 13-B 68-A

i.

PRICES SUBJECT TO CHANGE

18. Availability Statement: This translation was made from a non-copyrighted work. Libby Smith

19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 49
20. Security Class (This Page) UNCLASSIFIED	22. Price 4.00-2.25

Greetings from the Mayor.

The greatest problem facing Kawasaki City at the present time is to protect the city residents from public damage, to change Kawasaki, "the city of pollution," to Kawasaki "a city of good life," and to make every resident feel affection for the city as his "hometown."

The measures taken against this type of public damage by this city were first to newly establish the Public Damage Bureau in October, 1971, then to fully man the public damage administrative organs and to strengthen such activities as public damage surveillance, study and research and public damage control. In addition, an original public damage law adopted to the peculiarities of this city was passed in March, 1972. Such public damage prevention measures as the clarification of duties concerning the prevention of public damage, the establishment of environmental target values and their achievement, and the establishment of public damage control measures and the Public Damage Surveillance Council, were established.

One of the practical implementation measures was the establishment here of the Public Damage Surveillance Center which strengthened the air pollution measurement network and provides surveillance over generation sources.

As a result, it has been possible to maintain continuing surveillance over sulfur oxides emitted from factories and I firmly believe that this will make possible even more appropriate public damage countermeasures.

August, 1972

Saburo Ito

Mayor, Kawasaki City.

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ORGANIZATION AND ALLOCATION OF WORK

In order to reinforce air pollution surveillance, the Public Damage Surveillance Center was newly established in October, 1971, concurrently with the restructuring and raising of the Public Damage Division to bureau level.

The structure comprises a total of 13 persons, including administrators and measurement personnel under the chief.

The work performed by the administrators is principally administration of the surveillance center, the maintenance of statistics and analysis of air pollution measurement data.

The measurement personnel conduct constant surveillance of the state of air pollution, the sulfur dioxide gas concentration at the pollution sources and the quantity of fuel used during periods of emergency. When excessive quantities of sulfur dioxide gas are emitted, they direct and confirm fuel conversion and sulfur content reduction measures.

Maintenance control is fully accomplished so that the surveillance system will always operate smoothly.

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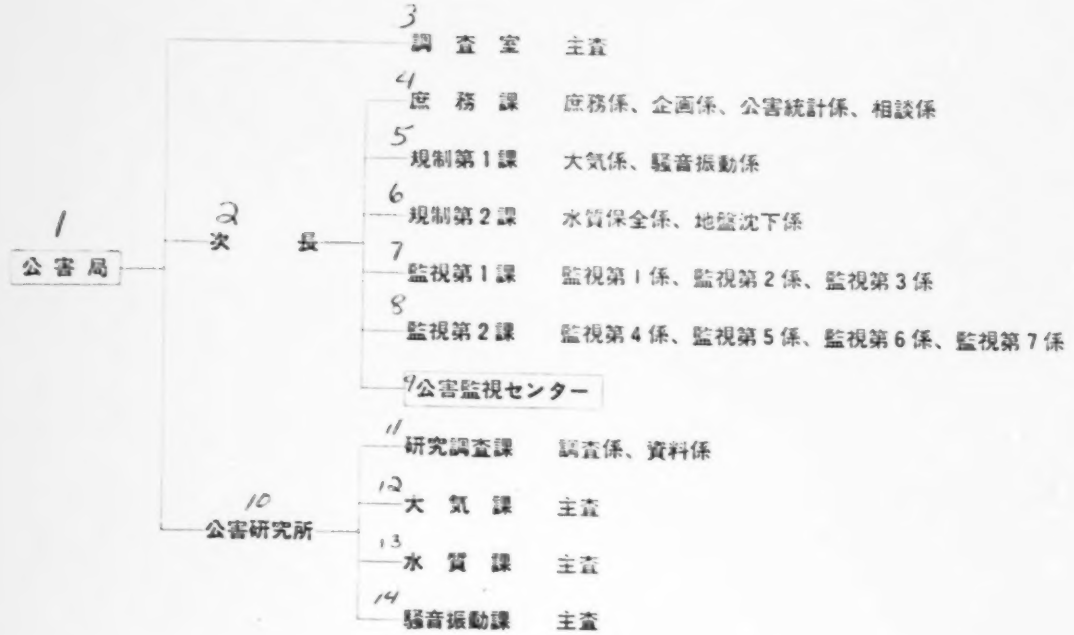
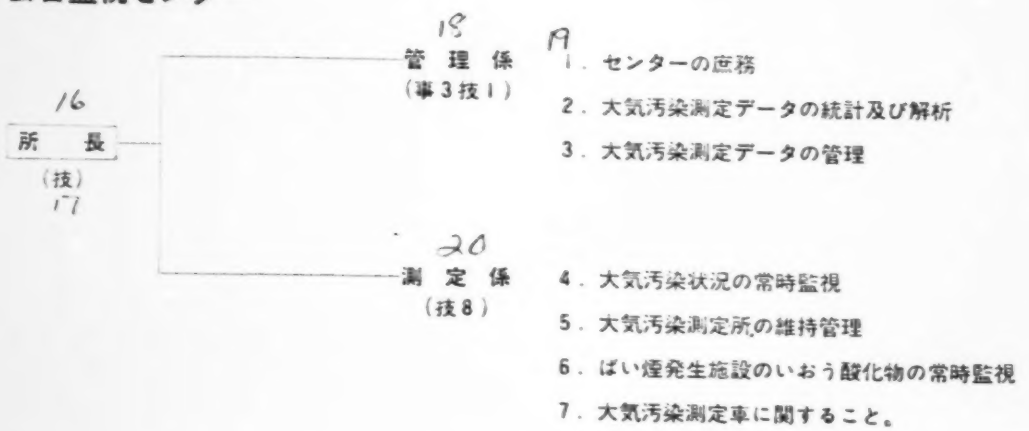

1
公害局
2
次長
3
調査室 主査
4
庶務課 庶務係、企画係、公害統計係、相談係
5
規制第1課 大気係、騒音振動係
6
規制第2課 水質保全係、地盤沈下係
7
監視第1課 監視第1係、監視第2係、監視第3係
8
監視第2課 監視第4係、監視第5係、監視第6係、監視第7係
9
公害監視センター
10
公害研究所
11
研究調査課 調査係、資料係
12
大気課 主査
13
水質課 主査
14
騒音振動課 主査

15

公害監視センター


16
所長
(技)
17
18
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(事3技1)
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1. センターの庶務
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5. 大気汚染測定所の維持管理
6. ばい煙発生施設のいおう酸化物の常時監視
7. 大気汚染測定車に関すること。

Legend for Chart:

1 - Public Damage Bureau.

2 - Deputy Chief.

3 - Investigation Office. Chief Investigator.

4 - General Affairs Branch. General Affairs Clerk, Planning Clerk, Public Damage Statistics Clerk, Consultant.

5 - First Control Branch. Air Clerk, Noise and Vibration Clerk.

6 - Second Control Branch. Water Safety Clerk, Ground Subsidence Clerk.

7 - First Surveillance Branch. First Surveillance Clerk, Second Surveillance Clerk, Third Surveillance Clerk.

8 - Second Surveillance Branch. Fourth Surveillance Clerk, Fifth Surveillance Clerk, Sixth Surveillance Clerk, Seventh Surveillance Clerk.

9 - Public Damage Surveillance Center.

10 - Public Damage Research Office.

11 - Public Damage Investigations Branch. Investigator, Data Clerk.

12 - Air Branch. Principal Investigator.

13 - Water Quality Branch. Principal Investigator.

14 - Noise and Vibration Branch. Principal Investigator.

15 - The Public Damage Surveillance Center.

16 - Chief.

17 - (Technical Officer).

18 - Administrators (3 administrative, 1 technical).

19 - 1. Center general affairs.

2. Air pollution measurement data statistics and analysis.

3. Control of Air pollution measurement data

Legend for Chart continued:

4. Normal surveillance of air pollution conditions.
5. Maintenance and control of air pollution measurement stations.
6. Normal surveillance of sulfur oxides from soot and smoke generating facilities.
7. Matters relating to the air pollution measurement vans.

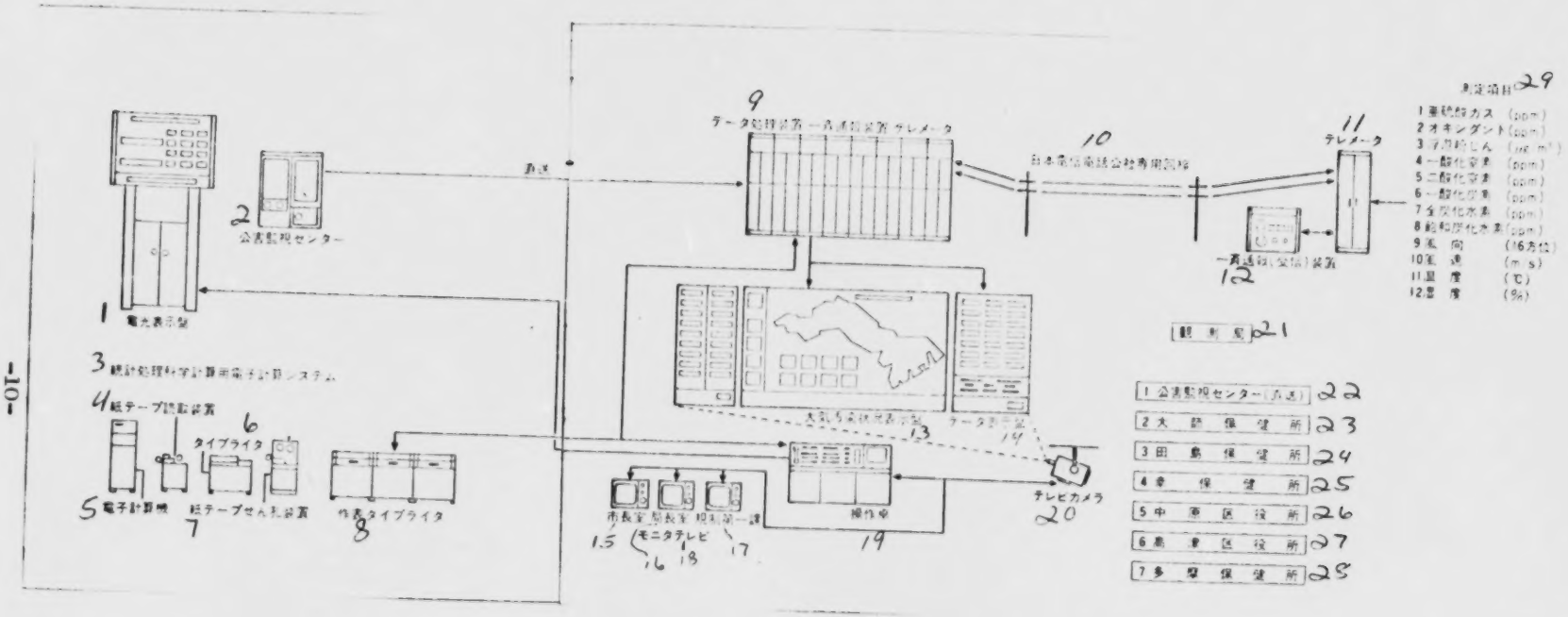
30 - Measurement personnel (8 technical officers).

OUTLINE OF THE AUTOMATIC AIR POLLUTION SURVEILLANCE SYSTEM

This system is formed principally of the Automatic Environmental Air Pollution Surveillance System, which regularly transmits telemetered data on the main air pollutants from the base measurement points (observation stations) and the relevant data concerning wind direction, wind speed, etc., to the Public Damage Surveillance Center (surveillance station), which exercises centralized surveillance, and the Automatic Generation Source Sulfur Dioxide Gas Surveillance System, which exercises surveillance and control by transmitting telemetered data concerning the sulfur dioxide gas concentrations emitted from and the quantity of fuel used by the 42 large factories which are the principal sulfur dioxide gas emission sources.

Concurrently with being processed and recorded by the data processing facilities, these transmitted data are also displayed on the light display board, the graphic panel, the data display board and the panel display board (generation sources). During emergency periods, when the environmental concentrations become high or when the quantities of sulfur dioxide gas emitted exceed the normal levels, the results are published by lamp display.

The Automatic Environmental Air Pollution Surveillance System



Legend for Figure:

1 - Electric light display panel

2 - Public Damage Surveillance Center

3 - Electronic computer system for statistical processing and scientific processing and scientific computing

4 - Paper tape readout system

5 - Electronic computer

6 - Typewriter

7 - Paper tape perforator

8 - Tabulating typewriter

9 - Data processor simultaneous reporting telemeter

10 - Private Japan Telegraph and Telephone Company line

11 - Telemeter

12 - Simultaneous report (receiving) apparatus

13 - Air pollution situation display panel

14 - Data display panel

15 - Mayor's Office

16 - Bureau Chief's Office

17 - No. 1 Control Branch

18 - Monitor television

19 - Operator's console

20 - Television camera

21 - Observation station

22 - Public Damage Surveillance Center (direct transmission)

23 - The Daishi Health Center

Legend for Figure continued:

24 - The Tajima Health Center

25 - The Saiwai Health Center

26 - The Nakahara Ward Office

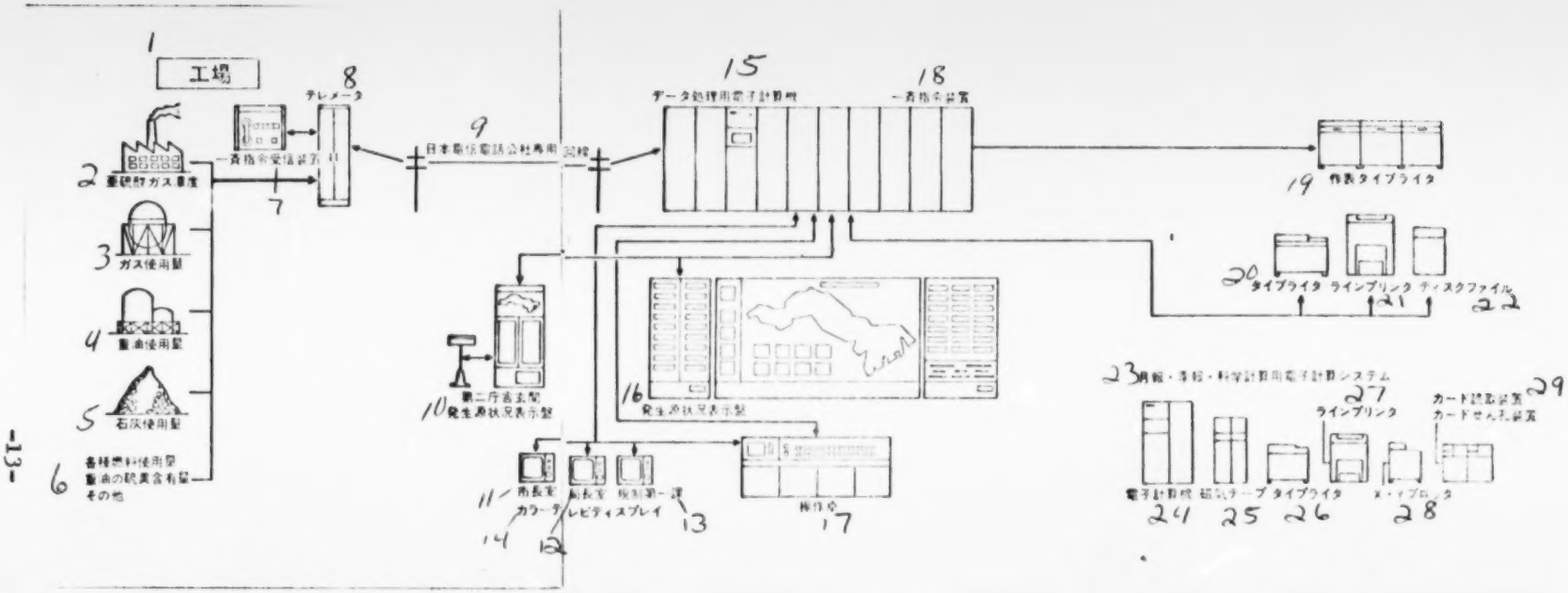
27 - The Takazu Ward Office

28 - The Tama Health Center

29 - Measured elements

1. Sulfur dioxide gas (ppm)
2. Oxidant (ppm)
3. Suspended dust ($\mu g/m^3$)
4. Nitric oxide (ppm)
5. Nitrogen dioxide (ppm)
6. Carbon monoxide (ppm)
7. Total hydrocarbons (ppm)
8. Saturated hydrocarbons (ppm)
9. Wind direction (16 points)
10. Wind speed (m/s)
11. Temperature (°C)
12. Humidity (%)

Automatic Generation Source Sulfur Dioxide Gas Surveillance System



Legend:

1 - factories; 2 - sulfur dioxide gas concentration; 3 - quantity of gas used; 4 - quantity of heavy oil used; 5 - quantity of coal used; 6 - quantity of various fuels used, heavy oil sulfur content, other; 7 - simultaneous command receiver; 8 - telemeter; 9 - private Japan Telephone and Telegraph Company line; 10 - second government office building gate generation source situation display panel; 11 - mayor's office; 12 - bureau chief's office; 13 - first control branch; 14 - color television display; 15 - data processing electronic computer; 16 - generation source status display panel; 17 - operator's console; 18 - simultaneous command apparatus; 19 - tabulating typewriter; 20 - typewriter; 21 - line printer; 22 - disc file; 23 - electronic computer system for monthly reports, seasonal reports and scientific calculations; 24 - electronic computer; 25 - magnetic tape; 26 - typewriter; 27 - line printer; 28 - X-Y plotter; 29 - card readout. Card puncher.

THE ENVIRONMENTAL AIR POLLUTION SURVEILLANCE SYSTEM

This system routinely transmits analogue telemetered data concerning the principal pollutants and the related wind direction, wind speed, etc., measured at the base measuring points (observation stations) to the Public Damage Surveillance Center (surveillance station), which is tied to them by private Japan Telephone and Telegraph Company lines and which exercises centralized surveillance. The various measurement data that are transmitted are processed in a data processor and are displayed on the graphic panel, the data display panel and the electric light display panels in front of the municipal offices. In addition to these results being recorded by the typewriter that is used for making the hourly reports and the daily reports, they are also recorded on paper tape for statistical processing for the daily and other reports.

In addition, when warningor alerts are being disseminated, this information can be transmitted to each base measurement point (observation station) separately or simultaneously.

The 7 Base Measurement Points (Observation Stations) and the 12 Items Measured

	1	SO	NO	NO_2	O_x	dust	CO	HC (saturated)	HC	3	4	5	6	7
8														
9														
10														
11														
12	5													
13	6													
14	7													

(Notes) ◎ Converted to telemetry before May, 1970. △ Converted to telemetry July, 1971. ○ Converted to telemetry June, 1972.

Legend:

1 - base measurement point; 2 - (saturated); 3 - wind direction; 4 - wind speed; 5 - temperature; 6 - humidity; 7 - notes; 8 - the Tajima Health Center; 9 - the Daishi Health Center; 10 - the Public Damage Surveillance Center; 11 - the Saiwai Health Center; 12 - the Nakahara Ward Office; 13 - the Takazu Ward Office; 14 - the Tama Health Center.

The various measurement instruments.

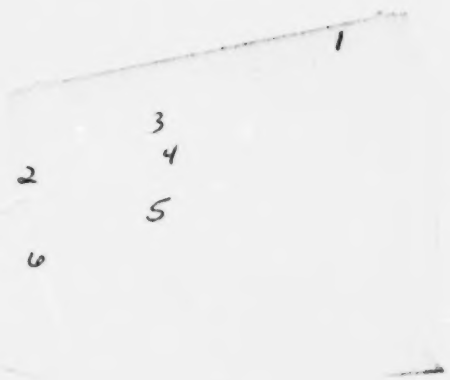
The telemetry transmitter.

THE SIMULTANEOUS REPORT RECEIVERS

When an air pollution warning or alert is issued, this information is transmitted immediately to each of the observation stations. Since a confirming signal is returned, it is possible to determine positively that this information has been transmitted.

THE AIR POLLUTION CONCENTRATION LIGHT DISPLAY PANEL

The sulfur dioxide concentration measured at the Daishi Health Center, the Tajima Health Center, and at the Public Damage Surveillance Center and the carbon monoxide concentration as measured in front of the Municipal Offices, are made known to the citizens by displaying the information by lights in front of the Municipal Offices. During air pollution emergencies, warnings and alerts are also displayed concurrently.



Legend:

1 - the present air pollution situation; 2 - sulfur dioxide gas concentration; 3 - central; 4 - Daishi; 5 - Tajima; 6 - carbon monoxide gas concentration, central.

THE FIXED AUTOMOTIVE EXHAUST GAS MEASUREMENT POINTS

Fixed measurement points were established during Fiscal Year 1972 at Endo-cho, Saiwai Ward, and at the Kitsuki 4-chome intersection in Nakahara Ward. These measure four elements: carbon monoxide, nitric oxide, nitrogen dioxide and the traffic at the intersection. These measured data are transmitted by telemetry just like the base measurement points, to the Public Damage Surveillance Center (surveillance station).

THE AUTOMATIC GENERATION SOURCE SULFUR DIOXIDE GAS SURVEILLANCE SYSTEM

Structure of the System

This system monitors the total sulfur dioxide gas emissions of 42 large factories (observation stations) which account for more than 90% of the sulfur dioxide gas emitted in this city. The measurement data at each of the factories on the quantity of fuel used, the sulfur dioxide gas concentration in the flues and the sulfur content of the heavy oil is telemetered by the scanning digital method over private Japan Telephone and Telegraph Company lines to the Public Damage Surveillance Center (surveillance station) every 15 minutes. The results are displayed by lamps on the panels placed in the central surveillance room and at the second government office building at the municipal offices. In addition, the measurement results are recorded with a line printer and on magnetic tape for statistical processing for the monthly and other reports.

During periods of emergency and when the quantity of sulfur dioxide gas emitted exceeds the normal values, orders to convert fuel and to take sulfur reduction measures are transmitted and confirmed by the simultaneous command equipment.

Sulfur content analysis meter

Heavy oil flow meter.

Sulfur dioxide gas and oxygen measuring meter.

Telemetry transmitter.

Simultaneous command receiver.

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Factories Where Generation Source Sulfur Dioxide Gas Automatic Surveillance Equipment is Placed and the Status of the Measurement Instruments

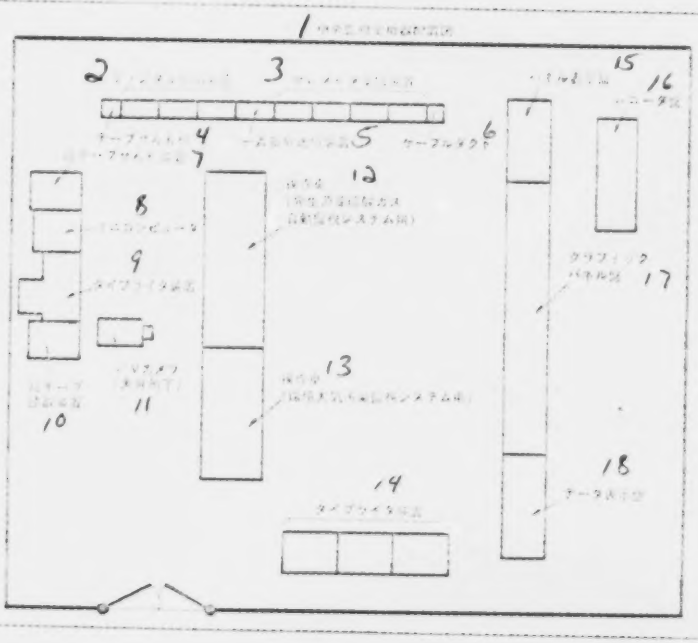
	1 地区	2 工場名		3 総数	4 測定器数	5 重油流量計	6 排煙脱硫ガス測定器	7 ガス流量計	8 石炭計量機	9 空気流量計	10 イオウ分析計	11 酸素測定器	12 排ガス流量計
				45	272	157	60	10	9	3	13	18	2
1	川崎区 13	日本鋼管工業㈱川崎製造所	a	1	6	5	1						
2	14 大師地区	いすゞ自動車㈱川崎工場	b	1	6	5	1						
3	〃	花王石鹸㈱川崎工場	c	1	5	4	1						
4	〃	日燃石油精製㈱	d	1	4	2	1				1		
5	〃	ヤネウル石油精製㈱	e	1	3	1	1				1		
6	〃	東燃石油化学㈱川崎工場	f	1	8	3	1	3			1		
7	〃	東亜燃料工業㈱	g	1	3	1	1	1					
8	〃	日本合成アルコール㈱	h	1	3	2	1						
9	〃	東洋ポリスチレン工業㈱	i	1	3	2	1						
10	〃	東レ㈱川崎工場	j	1	8	4	2	2					
11	〃	日本石油化学㈱ケミカル工場	k	1	3	2	1						
12	〃	日本セオン㈱川崎工場	l	1	6	4	1					1	
13	〃	旭化成工業㈱川崎支社	m	1	4	2	1					1	
14	〃	日本石油化学㈱川崎工場	n	1	9	5	2						2
15	〃	特殊鋼㈱	o	1	5	4	1						
16	〃	川崎化成工業㈱	p	1	5	3	1					1	
17	〃	昭和油化㈱川崎工場	q	1	7	5	2						
18	〃	日石三菱㈱化学㈱	r	1	6	5	1						
19	〃	東京電力㈱川崎火力発電所	s	2	14	6	2		4		2		
20	〃	東レ㈱千鳥川崎工場	t	1	5	3	1					1	
21	〃	日本合成㈱川崎工場	u	1	4	2	1					1	
22	〃	三井精機㈱川崎工場	v	1	3	2	1						
23	〃	東亜石油㈱川崎製油所	w	1	5	2	1				2		
24	〃	㈱東京鉄工所	x	1	5	4	1						
25	15 田島地区	ダイセルメントール㈱	y	1	11	9	1					1	
26	〃	日本鋼管㈱京浜製鉄所	z	3	18	9	5	3			1		
27	〃	昭和石油㈱川崎製油所	aa	1	9	6	2				1		
28	〃	昭和電工㈱川崎工場	bb	1	9	6	3						
29	〃	三菱石油㈱川崎製油所	cc	1	8	4	1	1			1	1	
30	〃	石原㈱川崎工場	dd	1	4	2	1					1	
31	〃	関東化成工業㈱	ee	1	8	4	3				1		
32	〃	東洋製罐㈱	ff	1	5	3	1					1	
33	〃	日本鋼管㈱川崎工場	gg	1	3	2	1						
34	〃	日本触媒㈱川崎工場	hh	1	5	3	1					1	
35	〃	東京電力㈱扇島火力発電所	ii	1	12	5	1		5		1		
36	〃	富士瓦斯紡績㈱川崎工場	jj	1	9	5	2					2	
37	16 川崎地区	味の素㈱川崎工場	kk	1	12	5	4			3			
38	〃	日本ゼオン㈱川崎工場	ll	1	4	2	1					1	
39	17 幸区	明治製糖㈱川崎工場	mm	1	4	2	1					1	
40	〃	三菱自動車工業㈱京都自動車	nn	1	7	5	1					1	
41	〃	日本分光㈱川崎工場	oo	1	4	2	1					1	
42	中原区 18	富士通㈱川崎工場	pp	1	10	5	2				1	2	

Legend for Table:

1 - district; 2 - factory; 3 - number of stations; 4 - total measurement instruments; 5 - heavy oil flow meter; 6 - sulfur dioxide gas meter; 7 - gas flow meter; 8 - coal scale; 9 - air flow meter; 10 - sulfur analyzer; 11 - oxygen meter; 12 - exhaust gas flow meter; 13 - Kawasaki Ward; 14 - Daishi District; 15 - Tajima District; 16 - Kawasaki District; 17 - Saiwai Ward; 18 - Nakahara Ward; 2a - Japan Metallurgical Industries (Ltd.) Kawasaki Manufacturing Plant; 2b - Isuzu Automobile, (Ltd.) Kawasaki Plant; 2c - Kao Soap (Ltd.) Kawasaki Plant; 2d - Hismi Petroleum Refinery (Ltd.); 2e - General Petroleum Refinery (Ltd.); 2f - Tonen Petrochemicals (Ltd.) Kawasaki Plant; 2g - Toa Fuel Industries (Ltd.); 2h - Nihon Synthetic Alcohol (Ltd.); 2i - Toyo Polystyrene Industries (Ltd.); 2j - Tore (Ltd.), Kawasaki Plant; 2k - Nihon Petrochemical (Ltd.), Ukishima Plant; 2l - Nihon Xeon (Ltd.), Kawaskai Plant; 2m - Asahi Syntehtics Industries (Ltd.), Kawasaki Plant; 2n - Nihon Petrochemicals (Ltd.), Kawasaki Plant; 2o - Special Steel Manufacturing (Ltd.); 2p - Kawasaki Synthetics Industries (Ltd.); 2q - Showa Petrochemical (Ltd.), Kawasaki Plant; 2r - Nisseki Resin Chemicals (Ltd.); 2s - Tokyo Electric Power (Ltd.) Kawasaki Thermoelectric Station; 2t - Tokyo Glass (Ltd.), Kawasaki Plant; 2u - Nihon Salt Manufacturing (Ltd.), Kawasaki Plant; 2v - Mitsui Sugar Refineries (Ltd.), Kawasaki Plant; 2w - Toa Petroleum (Ltd.), Kawasaki Plant; 2x - (Ltd.) Tokyo Foundry; 2y - Daiichi Cement; 2z - Nihon Steel Pipe (Ltd.) Tohan Ironworks; 2aa - Showa Petroleum (Ltd.), Kawasaki Refinery; 2bb - Showa Denko (Ltd.), Kawasaki Plant; 2cc - Mitsui Petroleum (Ltd.), Kawasaki Refinery; 2dd - Daito (Ltd.), Kawasaki Plant; 2ee - National Railroads Kawasaki Power Plant; 2ff - Toyo Steel Manufacturing (Ltd.); 2gg - Nihon Casting (Ltd.), Kawasaki Plant; 2hh - Nihon Glass (Ltd.), Kawasaki Plant; 2ii - Tokyo Electric Power (Ltd.) Tsurumi Thermoelectric Station; 2jj - Fuji Electric Manufacturing (Ltd.), Kawasaki Plant; 2kk - Ajinomoto (Ltd.), Kawasaki Plant; 2ll - Nihon Columbia (Ltd.), Kawasaki Plant; 2mm - Meiji Sugar Manufacturing (Ltd.), Kawasaki Plant; 2nn - Mitsubishi Automobile Manufacturing (Ltd.) Tokyo Automobiles [Tr. Note: SIC]; 2oo - Nihon Spring (Ltd.), Kawasaki Plant; 2pp - Fujitsu (Ltd.), Kawasaki Plant.

SURVEILLANCE STATION (CENTRAL SURVEILLANCE ROOM, DATA PROCESSING ROOM).

Central Surveillance Room.



Legend for Figure:

1. Central surveillance room instrument layout
2. Digital control apparatus
3. Telemetry receiver
4. Tape puncher
5. Simultaneous command transmitter
6. Cable duct
7. Paper tape puncher
8. Minicomputer
9. Typewriter
10. Paper tape reader
11. ITV camera (suspended from the ceiling)
12. Operator's console (for the generation source dioxide gas automatic surveillance system)
13. Operator's console (for the environmental air pollution surveillance system)
14. Typewriters
15. Panel display
16. Recorder panel
17. Graphic panel
18. Data display

Data Processing Room.

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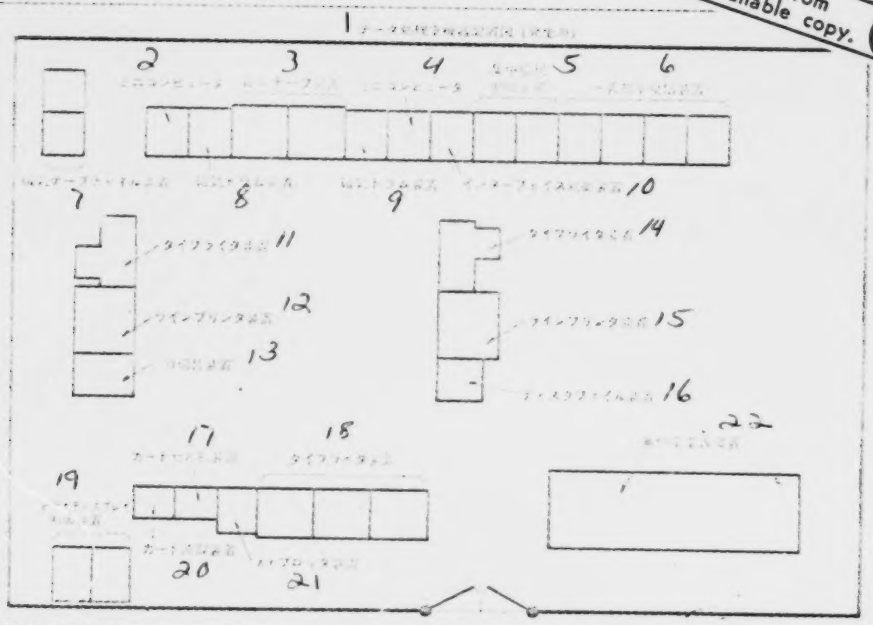

Legend for Figure:

1. Data processing room instrument layout (generation source)
2. Minicomputer
3. Magnetic tape apparatus
4. Minicomputer
5. Central surveillance control apparatus
6. Simultaneous command receiver
7. Magnetic tape channel apparatus
8. Magnetic drum apparatus
9. Magnetic drum apparatus
10. Interface control apparatus
11. Typewriter
12. Line printer
13. I/O switch
14. Typewriter
15. Line printer
16. Disc file apparatus
17. Card puncher
18. Typewriter
19. Video display control apparatus
20. Card reader
21. X/Y plotter
22. Emergency power source

Data Processing

The telemetered data from each of the measurement stations that is transmitted to the Public Damage Surveillance Center (surveillance station) is processed in a data processor formed of a minicomputer (environmental memory capacity 8K, generation source memory capacity 16K), an auxiliary memory apparatus (136K) interface control apparatus, a line printer and similar electronic computer components. In addition to the results being displayed on the graphic panel, the data display board and the panel display, they are recorded by the line printer and the paper tape perforator.

Data Analysis

This performs the basic tabulations of the data from the daily and other reports received from the data processing equipment using a minicomputer (memory capacity 12K) by each measurement subject, by type enterprise, or by district in the generation source system for the weekly, monthly, seasonal, and yearly reports. In addition, the correlation between each of the pollutants and with weather conditions, etc., are analyzed and tabulated.

As a result, air pollution concentrations are forecast, the diffusion of sulfur dioxide gas emitted from the generation sources is calculated and the effects on environmental pollution, etc., are analyzed.

Environmental air pollution data processor, simultaneous report transmitter, telemetry receiver.

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Generation source data processor, simultaneous command transmitter, telemetry receiver.

Data Display

Panel Display Board

The following lamp display is provided as part of the automatic generation source sulfur dioxide gas surveillance system. One of these panel display boards in addition to that at the Public Damage Surveillance Center, is provided at the Second Government Building, Municipal Offices, for publishing the data to the population.

The objects are the 42 large factories.

The quantity of sulfur dioxide gas emitted by each factor (normal, excessive) and the status of measures taken during emergencies.

The type of order in emergencies.

The Graphical Panel Board

The following are displayed on a map board of Kawasaki City as part of the environmental air pollution surveillance system.

In addition to digitally displaying the SO_2, Ox and wind speed at each of the measurement points, the wind direction is displayed with lamps (changed every 5 to 10 minutes).

Using the surface of the board, warnings are displayed by color, by section, using illuminating lights.

Type of order during emergencies (including Kanagawa Prefecture, Tokyo District, and Yokahama City).

The SO_2, Ox, wind direction, and wind speed for Tokyo and Yokahama City

during emergencies. (Two measurement locations in each).

Data Display Board

This displays all of the measurement data from the environmental air pollution surveillance system and the following can be displayed by choice.

Digital display concurrently of all of the data for each of the 12 measured elements for each base measurement point (observation station) (each hour).

The concurrent digital display of the data for one measurement item for all of the base measurement points (observation stations) (once each hour).

The digital display of SO_2, Ox, 1, 2 and 3 hours earlier for each base measurement point (observation stations).

Caution is evoked by illuminating a red lamp at any standard measurement point (observation station) when the measurement data exceed a standard value.

Legend:

1 - Kawasaki City air pollution display board; 2 - municipal air pollution alert; 3 - photochemical smog alert; 4 - smog forecast the day before in Tokyo; 5 - Yokahama City smog alert; 6 - hours; 7 - minutes; 8 - Public Damage Surveillance Center; 9 - Daishi Health Center; 10 - Tajima Health Center; 11 - Saiwai Health Center; 12 - Nakahara Ward Office; 13 - Takazu Ward Office; 14 - Tama Ward Office; 15 - sulfur dioxide gas (ppm); 16 - oxidant (ppm); 17 - suspended dust ($\mu g/m^3$); 18 - nitric oxide (ppm); 19 - nitrogen dioxide (ppm); 20 - carbon monoxide (ppm); 21 - total hydrocarbons (ppm); 22 - saturated hydrocarbons (ppm); 23 - wind speed (m/s); 24 - temperature (°C); 25 - humidity (%); 26 - Tajima Health Center; 27 - sulfur dioxide; 28 - one hour earlier; 29 - two hours earlier; 30 - three hours...; 31 - air Pollution Generation Source Status Display Board; 32 - panel display board; 33 - graphic panel board; 34 - data display board; 35 - panel display board (Municipal Offices, Government Building No. 2).

1 - Kawasaki City Air Pollution Situation Display Board.

Central Operator's Console

This is for the centralized operation of the surveillance lamps, the graphic panel board, the data display board, the panel display board, the color television equipment, the ITV, etc., and for liaison and command for the simultaneous transmission of orders to the measurement points (observation stations). Left side for the automatic generation source sulfur dioxide gas surveillance system. Right side for the automatic environmental air pollution surveillance system.

The Color Television Display System

This provides a color television display for the automatic generation source sulfur dioxide gas surveillance system covering the 42 subject factories (observation stations) giving the temporal changes in the quantity of sulfur dioxide gas emitted either by factory or by district and for the trends following the issuance of warnings.

The ITV

The displays on the graphic panel board, the data display board, and the panel display board in the central surveillance room are photographed with an ITV camera and reproduced by monitor television sets placed in the Mayor's Office, the Bureau Chief's Office and in the Center offices (the Headquarters No. 1 Control Branch).

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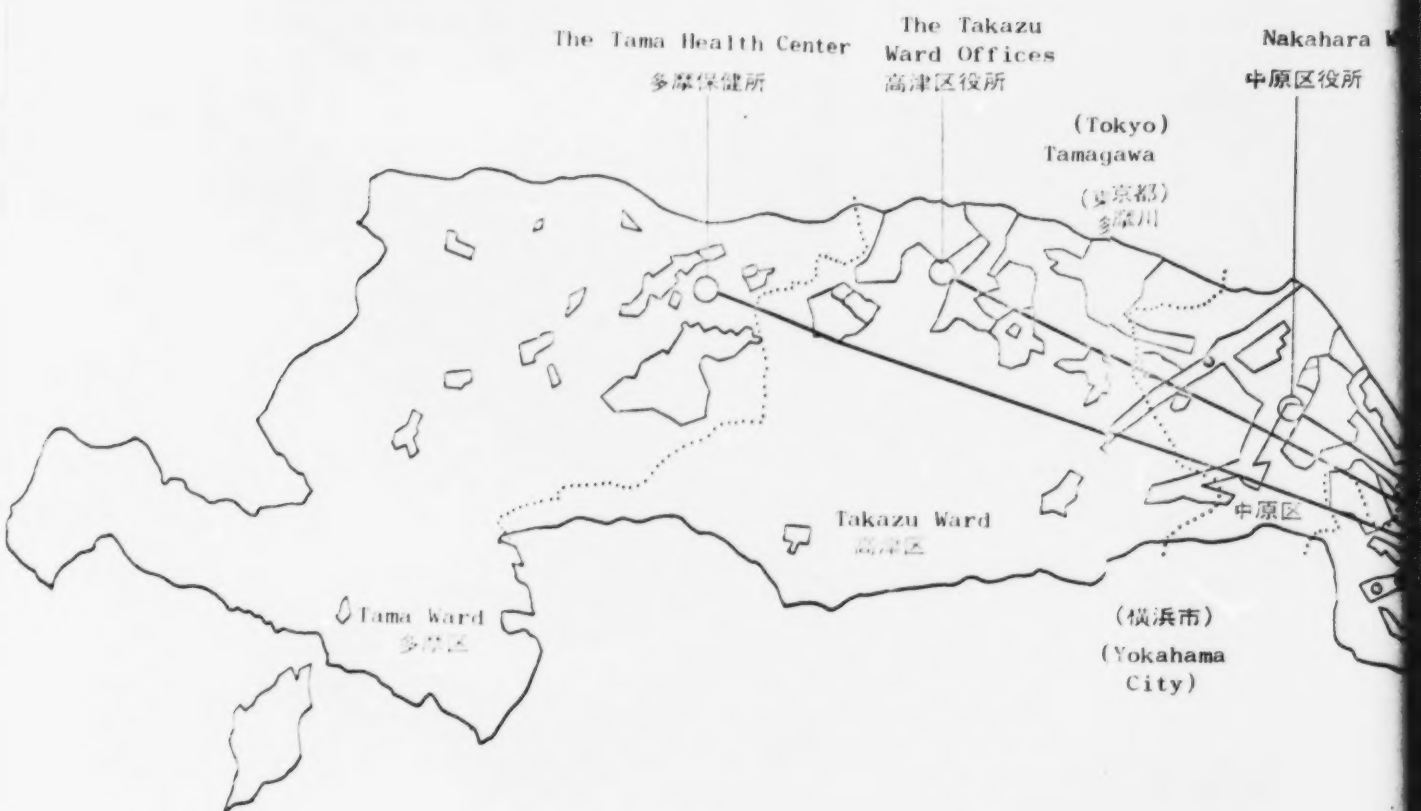
1 - Public Damage Surveillance Center; 2 - Daishi Health Center; 3 - Tajima Health Center; 4 - Saiwai Ward Offices; 5 - Nakahara Ward Offices; 6 - Takazu Ward Offices; 7 - Tama Ward Office; 8 - sulfur dioxide gas; 9 - oxidant; 10 - suspended dust; 11 - nitric oxide; 12 - nitrogen dioxide; 13 - carbon monoxide; 14 - total hydrocarbons.

The Simultaneous Command Transmitter

When a warning or an alert is issued, this information is transmitted either simultaneously or separately to each of the measurement points (observation stations) either by voice signal or by lamp display. At that time, the other party must return a confirming signal to the effect that he has received the order. For this reason, it is known that the information has been transmitted accurately.

大気汚染測定網地図

Map of the Air Pollution Measurement Net



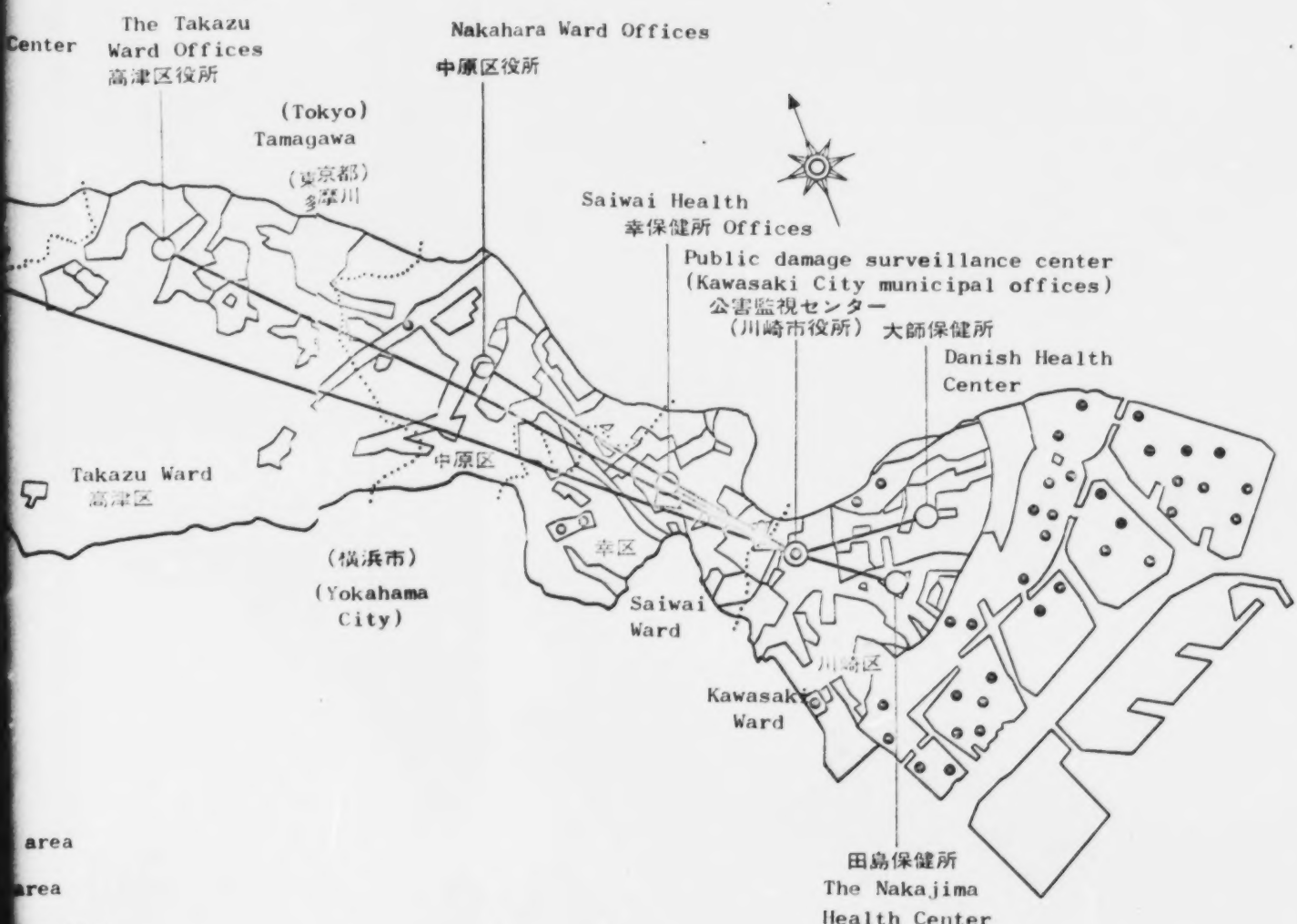
住居地域 Residential area

商業地域 Commercial area

準工業地域 Light industry area

工業地域 Industrial area

Note: ● Indica
genera
(注) ●は一般環境大気汚染



Note: ● Indicates the location of a factory in which automatic generation source sulfur dioxide gas surveillance equipment is placed.

注) ●は、発生源亜硫酸ガス自動監視装置設置工場の位置を示します。

OUTLINE OF THE FACILITIES

1. Location of the facility: No. 2-25, Miyamoto-cho, Kawasaki Ward, Kawasaki City

   Designed August, 1971

   Construction commenced September, 1971

   Construction completed April, 1972

2. Structure: Five story steel frame concrete. (Including the tower)

3. Area of the structure: 169.484 m^2

4. Floor area: Total 797.09 m^2

   Breakdown:

1st floor:	168.446 m^2	Health Offices
2nd floor:	158.318 m^2	Public Damage Surveillance Center Office
3rd floor:	158.318 m^2	Data Processing Room (pollution sources)
4th floor:	158.318 m^2	The Central Surveillance Room (environmental)
5th floor:	130.68 m^2	Air Pollution Measurement Room, Data Room
Tower :	28.01 m^2	

5. Construction cost: 517,990,000 yen

   Building: 78,090,000 yen

   Environmental telemetry equipment: 89,600,000 yen

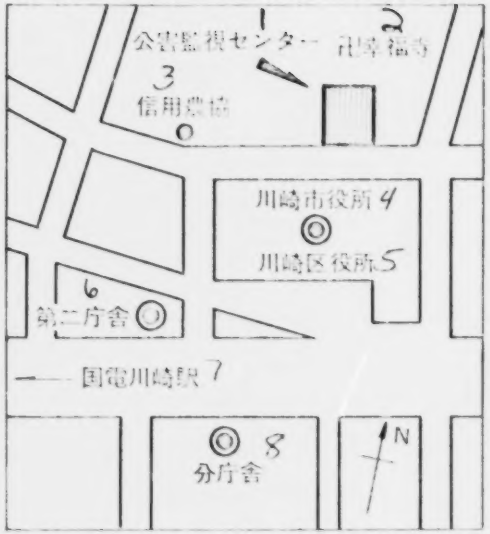
   Automatic generation source sulfur dioxide gas surveillance equipment: 350,300,000 yen

6. Builders:

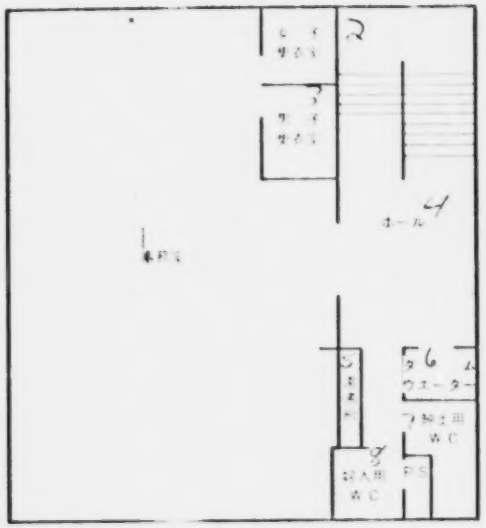
   Building: the Takei Building Company, Ltd.

The environmental telemetry and the generation source automatic surveillance equipment, Fujitsu Company, Ltd.

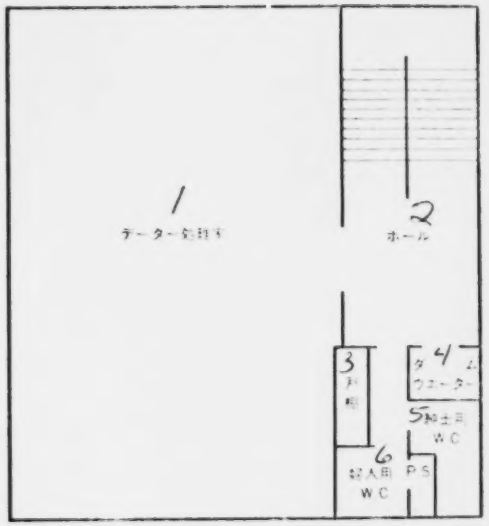
Location sketch



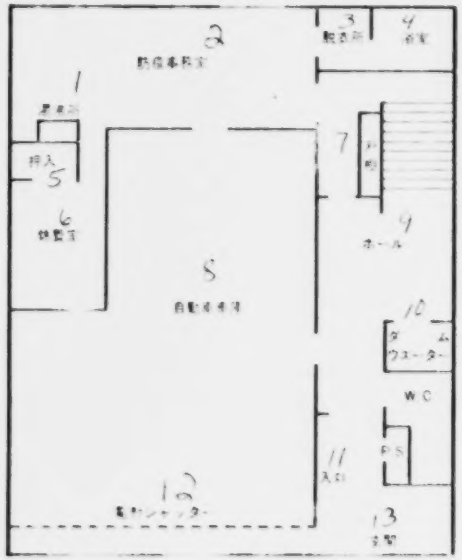
2nd floor



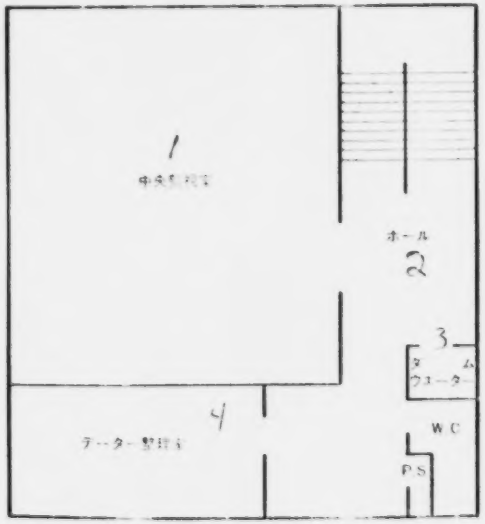
3rd floor



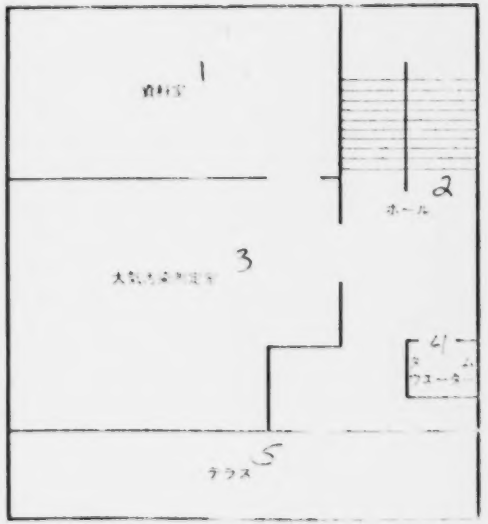
1st floor



4th floor



5th floor



Legend for Figures:

Location sketch

1 - public damage surveillance center; 2 - Kofukuji [Tr. Note: Temple]; 3 - Shinyo Agricultural Cooperative; 4 - Kawasaki Municipal Offices; 5 - Kawasaki Ward Offices; 6 - Second Government Building; 7 - to the National Electric Kawasaki Station; 8 - branch offices.

1st floor

1 - kitchenette; 2 - health office room; 3 - dressing room; 4 - bathroom; 5 - closet; 6 - lounge; 7 - shelves; 8 - garage; 9 - hall; 10 - dumbwaiter; 11 - entrance; 12 - electrically operating door.

2nd floor

1 - administrative office; 2 - ladies' dressing room; 3 - mens' dressing room; 4 - hall; 5 - kitchenette; 6 - dumbwaiter; 7 - mens' WC; 8 - ladies' WC.

3rd floor

1 - data processing room; 2 - hall; 3 - shelves; 4 - dumbwaiter; 5 - mens' WC; 6 - ladies' WC.

4th floor

1 - central surveillance room; 2 - hall; 3 dumbwaiter; 4 - data processing room.

5th floor

1 - data room; 2 - hall; 3 - air pollution measurement room; 4 - dumbwaiter; 5 - terrace.

THE HISTORY OF AIR POLLUTION SURVEILLANCE WORK IN KAWASAKI CITY

The time when air pollution was first addressed as a problem of public damage in this city was when industry began to advance in the early part of the Taisho Period [Tr. Note: 1912]. The quantity of dust emitted from the Asano Cement Company was particularly bad and, in 1923, a complaint was submitted to the prefectural governor over the name of the mayor of Daishi Machi. Subsequent to that time, the black smoke was stopped as a serious public damage problem which had implications for the city's prosperity. Development was halted and changed to ashes as a result of the wartime disasters. After the war, around 1950 and 1951, there was a striking development of factories in the littoral district because of the high economic growth of Japan and the superiority of the location which led to a rapid restoration and development.

In association with this, heat sources changed from coal to heavy oil. There was an increase in the utilization of fuel and the skies of Kawasaki became polluted by the soot and sulfur oxides emitted from the factories. With this background, attention was focussed on air pollution as the result of an incident that took place in August, 1955, when the leaves fell from the fig trees, which are a landmark of the Omoro District, overnight. In July, 1956, the first air pollution measurements in this city were commenced with the measurement of soot and dust fallout followed by the measurement of sulfur oxides by the lead dioxide method in May, 1957. Automatic measurement recording equipment was emplaced in 1964 and telemetry was established in 1972. (Within the Daishi Health Center).

Surveillance air pollution centralized equipment was provided within

these offices in March, 1968, making possible direct surveillance of the measured values at three measurement points by telemetry. With this the structure, the air pollution surveillance system was generally established. The surveillance system was strengthened subsequent to that time and, augmented by three measurement stations, including the prefectural measurement stations. Together with this it became necessary to measure the pollutants from automotive exhaust gases that formed the sources for the generation of photochemical smog, etc., and at the present time, measurement of 12 items is accomplished at each of the measurement points.

After the beginning of Fiscal Year 1972, a system for the automatic surveillance of sulfur dioxide gas, in order to provide for the surveillance of sulfur dioxide gas emissions, was established together with 42 large factories who were the principal generation sources (contract factories and memorandum of agree factories) making it possible to conduct centralized surveillance of this and environmental pollution at all of the public damage surveillance centers.

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Legend:

1 - The present air pollution situation.

2 - Sulfur dioxide gas concentration

3 - Central

4 - Daishi

5 - Tajima

6 - carbon monoxide gas concentration, Central

Important Dates

July, 1956. Deposit gauges in 16 locations for the measurement of soot and dust fallout.

May, 1957. Measurement of sulfur oxides by the lead dioxide method, 15 locations.

March, 1964. Automatic air pollution measurement and recording equipment, established at the Health Research Laboratory (the present Research Institute).

March, 1965. Automatic air pollution measurement and recording equipment, established at the Daishi Branch Office (present Health Center) and the Nakahara Health Center (now at the Ward Offices).

November, 1966. Establishment of television for the normal surveillance of soot and smoke, Public Damage Branch, this Agency.

March, 1967. Establishment of automatic wind direction and wind speed recording equipment in this office.

May, 1967. Establishment of telemetry equipment in the automatic air pollution recording devices at the main offices and the Omoro Health Center.

August, 1967. Assigned responsibility for the control and operation of the national air pollution measurement station (Tajima Health Center).

March, 1968. Establishment of central air pollution surveillance apparatus in the head office.

A structure within this agency for direct surveillance by the telemetry of sulfur dioxide, dust, wind direction, and wind speed measurement

data from the Daishi Health Center, the Public Health Experimental Laboratory and the Nakahara Branch Office.

May, 1970. The establishment of telemetry in the automatic air pollution recording devices at the Nakajima Health Center (National).

August, 1970. Agreements made with 39 large factories concerning the prevention of air pollution (these subsequently became object factories for source surveillance).

October, 1970. Automatic recording equipment for oxidant in four measurement stations.

March, 1971. New establishment of an air pollution measurement station in the Osaiwai (currently Saiwai) Health Center.

March, 1971. Mobile air pollution measurement van purchased.

Air pollution concentration light display panel established in front of the municipal offices.

Prefectural air pollution measurement stations newly established at the Takazu Branch Office and at the Inada (currently Tama) Health Center.

October, 1971. New establishment of a Public Damage Surveillance Center as a result of a reorganization.

April, 1972. Construction of the Public Damage Surveillance Center building completed.

June, 1972. The environmental air pollution surveillance system completed.

August, 1972. The generation source sulfur dioxide gas automatic surveillance system completed.